ECONOMIC COMMENTARY

Alberta's Plastic Resins and Plastic Products Industry

January 30, 2017

Highlights:

The plastic resins and plastic products sectors are closely tied as most of the goods that the plastic products sector purchases to produce its products come from the plastic resins sector. In 2015, Alberta's plastic resins and plastic products industry had revenues of $6.3 billion, accounting for 9.4% of total manufacturing revenues.

Alberta Government

Overview

Alberta has the largest plastic resins sector in Canada, just ahead of Ontario, in part because of easy access to Alberta's ethane supplies, which are processed in the petrochemicals sector into ethylene which in turn is the largest input into Alberta's plastic resin sector. These resins are exported widely and are also the largest input into Alberta's plastic products sector. Alberta's plastic products sector is the third largest in Canada, well behind Ontario and Quebec.

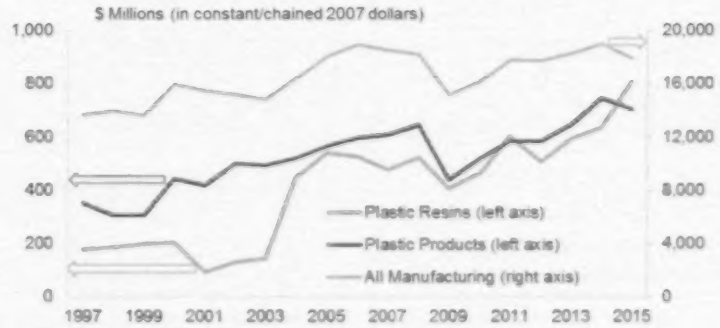
In 2015, Alberta's plastic resins and plastic products industry[1] (plastics industry) was one of the province's largest manufacturing industries with total revenues of $6.3 billion, accounting for 9.4% of total manufacturing revenues. Plastic resins revenues were $4.7 billion and the plastic products' revenues were $1.6 billion. On a Gross Domestic Product (GDP) basis, this industry's share of manufacturing output was 8.4%[2] in 2015 (in constant 2007 dollars).

Trends in Output, Revenues and Employment

The plastics industry is one of Alberta's strongest growing manufacturing industries during the past decade, but it also saw sharp declines in revenues in both the Great Recession of 2009 and in the current recession as prices of chemicals and refinery products generally fall sharply during recessions.

Between 2005 and 2015, output volumes of the plastics industry increased by 37%, compared with a 1% drop in GDP for Alberta's manufacturing sector (Chart 1). This strong 10-year growth was the result of a nearly 50% jump in the production of synthetic resins, such as polyethylene, and a 25% increase for plastic products such as plastic and foam building and construction materials.

Chart 1
GDP Trends in the Plastic Resin and Plastic Product Sectors



Source: Statistics Canada

The plastics industry's GDP more than doubled between 2001 and 2005, did not see much change between 2005 and 2008 as a result of a shortage of ethane feedstock and plunged 27% in 2009 because of the global recession. Output has increased since

[1] Includes NAICS sectors 3252 (resin, synthetic rubber, and artificial and synthetic fibres and filaments manufacturing) and 3261 (plastic product manufacturing). Note: 3252 is part of the chemicals industry.

[2] The ratio of GDP to revenues is relatively low for the plastic resins sector due to the fact that most of that sub-sector's inputs consist of petrochemicals (such as ethylene) rather than labour. GDP estimates don't include inputs of goods and services but do include inputs of labour (and also corporate profits). As a result, the plastics's share is lower for GDP than for revenues.

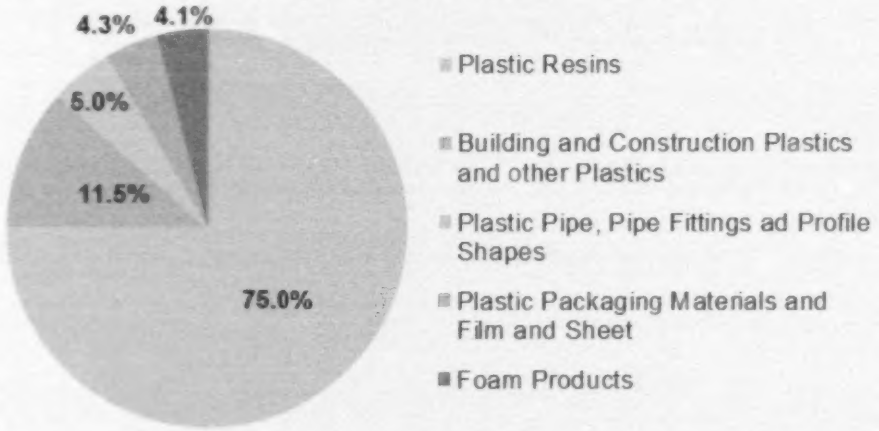
then, growing by 79% between 2009 and 2015, mainly as a result of a doubling in volumes of synthetic resins, such as polyethylene and other ethylene polymers, and strong growth in plastics products, such as plastics windows and doors.

The value of sales in the plastics industry rose 39% between 2005 and 2015 to $6.3 billion. They increased by 20% between 2005 and 2008 to $5.5 billion, mostly as a result of rising export values of polyethylene resins. The plastics industry's revenues tumbled 28% in 2009, as both prices and volumes of plastic resins and plastic products declined due to the global recession. Revenues grew by 52% between 2009 and 2015 to a record $6.3 billion as export prices of plastic resins increased strongly during that period.

The industry's largest sub-sectors on a revenue basis are:

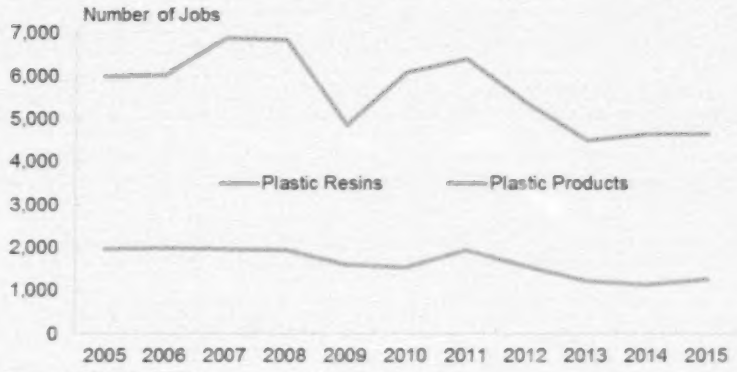
- Resins and synthetic rubber (such as polyethylene): $4.7 billion in 2015. Sales rose 43% between 2005 and 2015: they rose 23% between 2005 and 2008; fell by one-quarter in 2009; rose 39% between 2009 and 2014; and increased 14% in 2015.
- Building and construction fabricated plastics (non-foam) and other plastics (such as plastic windows and doors): $730 million in 2015. Sales increased by 16% between 2005 and 2015. Sales of plastic windows and doors rose from less than $50 million in 2005 to $468 million in 2015.
- Plastic pipe, pipe fittings and unlaminated profile shapes: $317 million in 2015. Sales rose 14% between 2005 and 2015.
- Plastic packaging materials and unlaminated film and sheet (of ethylene, styrene and propylene polymers): $271 million in 2015.
- Foam products (such as polystyrene foam and polyurethane foam): $262 million in 2015; up from $155 million in 2006.

Revenue Shares in 2015 for Major PRP Sub-Sectors



The number of employees in the plastics industry fell from about 8,000 in 2005 to 6,565[3] in 2015 (Chart 2). The industry's workforce increased to 8,820 employees in 2009 as employment in the plastic products sector increased by more than 800. However, employment in the industry has declined by more than 2,200 since 2008, with most of these losses coming in 2009. Although the plastic resins sector accounts for about three-quarters of the plastics industry's revenues it accounts for less than one-quarter of employment. The main reason for this is that the plastic resins sector is much more capital intensive than the plastic products sector, while the latter is far more labour intensive.

Chart 2
Employment Trends in the Plastic Resin and Plastic Products Sectors



Source: Statistics Canada

The plastics industry includes 171 business establishments with employees, of which 22% have more than 50 employees. Of these 171 establishments 159 are part of the plastic products sector and 12 of the plastic resins sector. About 78% of the number of plastics businesses is categorized as being small (less than 50 employees). There are four companies in this industry with more than 200 employees and all four fall in the plastic window and door manufacturing sub-sector.

What are the Plastics Industry's Main Products?

To come up with a list of the industry's top commodities is challenging as revenue estimates for most commodities are suppressed by Statistics Canada for reasons of confidentiality. Therefore, we will examine a number of sources including export statistics (next section).

Polyethylene[4] is by far the largest commodity produced in the plastics industry, both on a volume and value of sales basis. Although estimates of sales of polyethylene are suppressed by Statistics Canada we have estimated that about 90% of the $4.7 billion in sales of the resin, synthetic rubber, and artificial and synthetic fibres and filaments manufacturing sub-sector in 2015 can be attributed to polyethylene sales. The estimate of $4.3 billion in polyethylene sales is based on polyethylene exports from Alberta totaling $4.0 billion that year, exports accounting for about 85% of Canadian production

[3] Estimates from Statistics Canada Table 383-0029 Labour productivity and related variables by business sector industry

[4] Polyethylene estimates combine low, linear low and high density polyethylene and ethylene polymers

and Alberta being by far the largest polyethylene producing province. Sales volumes likely totaled between 2.6 and 2.8 million tonnes in 2015.
Other major products produced by Alberta's plastics industry include:

- Plastic windows and doors: $468 million in 2015 (the fastest growing plastics sub-sector between 2005 and 2015)
- Plastic pipe, pipe fittings and unlaminated profile shapes: $317 million in sales
- Plastic packaging materials and unlaminated film and sheet (of ethylene, styrene and propylene polymers): $271 million
- Polystyrene and urethane foam products: $262 million in sales
- Ethylene vinyl acetate: at least $150 million

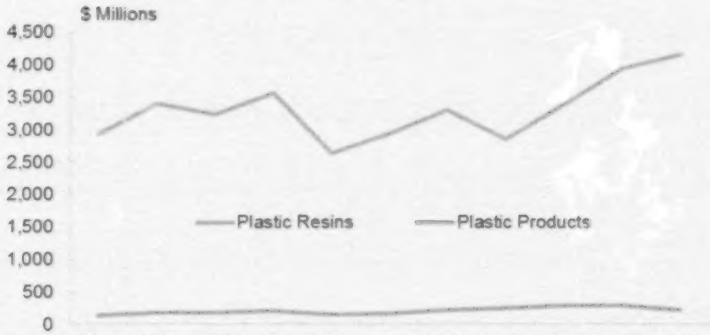
Markets

Approximately 23% of the plastics industry's output in 2013[5] was shipped to customers within the province, mainly plastic and foam building and construction materials such as plastic windows and doors. A further 14% is shipped to customers in other provinces, such as Ontario and B.C., also mostly plastic products.

About 63% of this industry's production is exported internationally. Although plastic products account for just over 30% of this industry's revenues, they account for only 8% of international exports (Chart 3).

About 16% of sales by the plastic products sector are destined for international markets, primarily for the U.S. More than one-half of sales stay within the province and 29% get shipped to other provinces.

Chart 3
Exports of Plastic Resins Reach Record High in 2015



Source: Statistics Canada

In the plastic resins sector 84% of sales are destined for international markets with about 85% of international exports going to the U.S., 6% to Mexico and 5% to China. A further 8% is being shipped inter-provincially and another 8% is staying within the province and is primarily destined for Alberta's plastic products manufacturers.

[5] 2013 is the latest year for which estimates are available for international and inter-provincial exports and imports and for intra-Alberta trade (source: Statistics Canada's Input-Output database). International export estimates are more timely and are available on a monthly basis from Statistics Canada's trade database (latest month Oct. 2016).

The plastic resin sector accounts for more than 90% of the plastics industry's international export value. Plastics exports rose 42% between 2005 and 2015 to $4.4 billion. They increased sharply between 2005 and 2008 to $3.8 billion as prices and volumes of resins increased. The plastics industry's exports fell by 26% in 2009, as exports to the U.S., which account for about 85% of Alberta's plastics exports, fell by 30%. Exports have recovered strongly since then, growing by 57% between 2009 and 2015 to a record $4.4 billion as the export volumes and prices of ethylene polymers, such as polyethylene, increased.

The following commodities also had high export sales values in 2015:

- Ethylene polymers (such as polyethylene): $4.0 billion in 2015; up 49% from 2005
- Acetate copolymers: $150 million; up 14%
- Plastic packaging materials and unlaminated film and sheet (of ethylene, styrene and propylene polymers): $51 million; up 94%
- Plastic tubes, pipes and hoses: $46 million; up 57%

The plastics industry's largest international export markets are the U.S., with an 85% export share in 2015, followed by Mexico (5%) and China (4%).

Imports

In 2013, imports of plastic products and plastic resins totaled $2.3 billion. Imports of plastic products were $1.8 billion: inter-provincial imports were $1.0 billion (almost one-half came from Ontario) and international imports $785 million. Almost half of the $1.8 billion in imports were plastic and foam building and construction materials, such as windows and doors and polyethylene and urethane foam products. Imports of plastic resins were $466 million: inter-provincial imports were $55 million and international imports $411 million.

What are the Largest Inputs of the Plastics Industry?

In order to determine the largest inputs on a value basis of the plastics industry we examined the 2013 provincial Input-Output tables.

In the synthetic resins sector, petrochemicals (for instance ethylene) are the largest input with a 45% share. Wages and salaries and corporate profits account for 30% of the input value. Other chemicals account for 5% and transportation services for 4%.

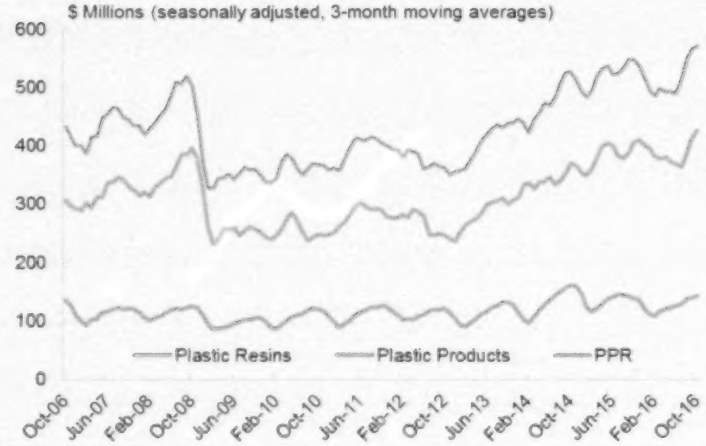
The number one input for the plastic products sector is wages and salaries and corporate profits with a 38% share. Plastic resins account for about 30% of inputs. Hardware has a roughly 4% input share and transportation services account for 3%.

How was the Plastics Industry Performing in 2016?

After a 10% gain in 2015 this industry's revenues declined by about 4% in the first half of 2016 compared to the same period of 2015 on lower resin prices. However,

revenues have increased since then and reached new highs in August, September and October (Chart 4) on higher prices and volumes of plastic resins. Exports have fallen 0.7% in the plastic resins sector during the first 11 months of 2016 compared with 2015 and exports of plastic products are 0.3% higher this year. Exports declined during the first five months of 2016 and have improved since then.

Chart 4
Value of Sales by the Plastic Resin and Plastic Products Sectors



Source: Statistics Canada

Major Indicators for the Plastic Resins and Plastic Products Industry					
	2005	2010	2014	2015	% Change 2005-2015
Revenues ($Millions)	4,564	4,383	5,801	6,323	39%
- Plastic Resins	3,314	3,091	4,170	4,749	43%
- Plastic Products	1,249	1,292	1,631	1,574	26%
GDP (Millions of chained $)	1,104	978	1,377	1,509	37%
- Plastic Resins	540	462	633	806	49%
- Plastic Products	564	516	744	703	25%
Number of establishments (with employees)	190	162	165	171	*
- Plastic Resins	23	13	11	12	*
- Plastic Products	167	149	154	159	*
Number of jobs	7,970	7,640	5,810	5,935	-26%
- Plastic Resins	1,970	1,550	1,150	1,275	-35%
- Plastic Products	6,000	6,090	4,660	4,660	-22%
International exports ($Millions)	3,082	3,095	4,224	4,386	42%
- Plastic Resins	2,936	2,933	3,940	4,166	42%
- Plastic Products	146	162	284	220	51%

Source: Statistics Canada

* Changes to the Business Register's methodology or business industrial classification strategies can bring about increases or decreases in the number of active businesses reported in the Canadian business counts. As a result, the data do not represent changes in the business population over time. Statistics Canada recommends users not to use the data as a time series.